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1 [Using age registers for a simple load-store queue filtering](#)

[E. Castro](#), [D. Chayer](#), [L. Pinuel](#), [M. Prieto](#), [F. Tirado](#)

February 2009

Journal of Systems Architecture: the EUROMICRO Journal, Volume 55 Issue 2

Publisher: Elsevier North-Holland, Inc.

Bibliometrics: Downloads (6 Weeks): n/a, Downloads (12 Months): n/a, Downloads (Overall): n/a, Citation Count

One of the main challenges of modern processor design is the implementation of a scalable and efficient mechanism to detect memory access order violations as a result of out-of-order execution. Traditional age-ordered associative load and store queues ...

Keywords: Age registers, Age-based Filtering, Energy-efficiency, LSW

2 [On the automatic parallelization of sparse and irregular Fortran programs](#) [1] This work is supported in part by Army contract DABT63-95-C-6097, Army contract N66001-97-C-8532, NSF contract MIP-9619351, and a Partnership Award from IBM. This work is not necessarily representative of the positions or policies of Army or Government.

[Yuan Lin](#), [David Padua](#)

August 1999

Scientific Programming, Volume 7 Issue 3-4

Publisher: IOS Press

Bibliometrics: Downloads (6 Weeks): n/a, Downloads (12 Months): n/a, Downloads (Overall): n/a, Citation Count

Automatic parallelization is usually believed to be less effective at exploiting implicit parallelism in sparse/irregular programs than in their dense/regular counterparts. However, not much is really known because there have been few research reports ...

3 [A "flight data recorder" for enabling full-system multiprocessor deterministic replay](#)

[Min Xu](#), [Rastislav Bodik](#), [Mark D. Hill](#)

June 2003

ISCA '03: Proceedings of the 30th annual international symposium on Computer architecture

Publisher: ACM

Full text available: [PDF](#) (311.95 KB)

Bibliometrics: Downloads (6 Weeks): 11, Downloads (12 Months): 85, Downloads (Overall): 733, Citation Count:

Debuggers have been proven indispensable in improving software reliability. Unfortunately, on most real-life software, debuggers fail to deliver their most essential feature --- a faithful replay of the execution. The reason non-determinism caused ...

Also published in:

May 2003 **SIGARCH Computer Architecture News** Volume 31 Issue 2

4 [Smart diagnostics for configurable processor verification](#)

[Sadik Ezer](#), [Scott Johnson](#)

June 2005

DAC '05: Proceedings of the 42nd annual Design Automation Conference

Publisher: ACM [Request Permissions](#)

Full text available: [PDF](#) (228.59 KB)

Bibliometrics: Downloads (6 Weeks): 0, Downloads (12 Months): 8, Downloads (Overall): 163, Citation Count: 0

This paper describes a novel technique called Embedded Test-bench Control (ETC), extensively used in the verification of Tensilica's latest configurable processor. Conventional simulation-based verification methodology that employ assembly programs ...

Keywords: configurable processors, coverage, diagnostics, embedded test-bench control, functional verification

5 [AVIO: detecting atomicity violations via access interleaving invariants](#)

Shan Lu, Joseph Tucek, Feng Qin, Yuanxuan Zhou

November 2006 **ASPLOS-XII: Proceedings of the 12th international conference on Architectural support for programming languages and operating systems****Publisher:** ACM [Request Permissions](#)Full text available: [Pdf](#) (394.45 KB)**Bibliometrics:** Downloads (6 Weeks): 15, Downloads (12 Months): 150, Downloads (Overall): 864, Citation Count

Concurrency bugs are among the most difficult to test and diagnose of all software bugs. The multicore technology trend worsens this problem. Most previous concurrency bug detection work focuses on one bug subclass, data races, and neglects many other ...

Keywords: atomicity violation, bug detection, concurrency bug, concurrent program, hardware support, program invariant

Also published in:

October 2006 **SIGOPS Operating Systems Review** Volume 40 Issue 5October 2006 **SIGARCH Computer Architecture News** Volume 34 Issue 5November 2006 **SIGPLAN Notices** Volume 41 Issue 116 [Research in mobile database query optimization and processing](#)

Agustinus Borge Weluwa, Bala Srinivasan, David Tenier

December 2005

Mobile Information Systems, Volume 1 Issue 4**Publisher:** IOS Press**Bibliometrics:** Downloads (6 Weeks): n/a, Downloads (12 Months): n/a, Downloads (Overall): n/a, Citation Count

The emergence of mobile computing provides the ability to access information at any time and place. However as mobile computing environments have inherent factors like power, storage, asymmetric communication cost and bandwidth limitations, efficient ...

Keywords: Mobile database, data broadcasting, data caching, data dissemination, mobile computing, query optimisation and processing, wireless database information retrieval

7 [The RDF-3X engine for scalable management of RDF data](#)

Thomas Neumann, Gerhard Weikum

February 2010

The VLDB Journal — The International Journal on Very Large Data Bases, Volume Issue 1**Publisher:** Springer-Verlag New York, Inc.Full text available: [Pdf](#) (1.09 MB)**Bibliometrics:** Downloads (6 Weeks): 26, Downloads (12 Months): 207, Downloads (Overall): 207, Citation Count

RDF is a data model for schema-free structured information that is gaining momentum in the context of Semantic Web data, life sciences, and also Web 2.0 platforms. The "pay-as-you-go" nature of RDF and the flexible pattern-matching capabilities of its ...

Keywords: Batched updates, Database engine, Indexing, Query optimization, Query processing, RDF, SPARQL

8 [The stretched exponential distribution of internet media access patterns](#)

Lei Guo, Enhua Tan, Songqing Chen, Zhen Xiao, Xiaodong Zhang

August 2008

PODC '08: Proceedings of the twenty-seventh ACM symposium on Principles of distributed computing**Publisher:** ACM [Request Permissions](#)Full text available: [Pdf](#) (3.01 MB)**Bibliometrics:** Downloads (6 Weeks): 11, Downloads (12 Months): 116, Downloads (Overall): 278, Citation Count

The commonly agreed Zipf-like access pattern of Web workloads is mainly based on Internet measurements when text-based content dominated the Web traffic. However, with dramatic increase of media traffic on the Internet, the inconsistency between the ...

Keywords: modeling, multimedia, traffic analysis

9 [A component model of spatial locality](#)

Xiaoming Gu, Ian Christopher, Yanxin Bai, Chenliang Zhang, Chen Ding

June 2009

ISMM '09: Proceedings of the 2009 international symposium on Memory management**Publisher:** ACM [Request Permissions](#)Full text available: [Pdf](#) (667.85 KB)**Bibliometrics:** Downloads (6 Weeks): 8, Downloads (12 Months): 72, Downloads (Overall): 123, Citation Count: 3

Good spatial locality alleviates both the latency and bandwidth problem of memory by boosting the effect of prefetching and improving the utilization of cache. However, conventional definitions of spatial locality are inadequate for a programmer to precisely ...

Keywords: reuse distance, spatial locality

10 [An Efficient Memory Organization for High-ILP Inner Modem Baseband SDR Processors](#)

[Bjorn De Sutter](#), [Osman Altun](#), [Praveen Raghavan](#), [Roeland Vandebruijn](#), [Hans Cappelle](#), [Tam Vander Aa](#), [Sinfeng Mei](#)

November 2010

Journal of Signal Processing Systems , Volume 61 Issue 2

Publisher: Kluwer Academic Publishers

Bibliometrics: Downloads (6 Weeks): n/a, Downloads (12 Months): n/a, Downloads (Overall): n/a, Citation Count

This paper presents a memory organization for SDR inner modem baseband processors that focus on exploiting ILP. This memory organization uses power-efficient, single-ported, interleaved scratch-pad memory banks to provide enough bandwidth to a high-ILP ...

Keywords: Instruction-level parallelism, Interleaved memory, Memory queues, Memory-level parallelism, Software-defined radio

11 [Software prefetching for mark-sweep garbage collection: hardware analysis and software redesign](#)

[Chen-Yong Cher](#), [Antony L. Hosking](#), [L. N. Vijaykumar](#)

December 2004 **ASPLOS-XI**: Proceedings of the 11th international conference on Architectural support for programming languages and operating systems

Publisher: ACM [Request Permissions](#)

Full text available: [Pdf](#) (165.32 KB)

Bibliometrics: Downloads (6 Weeks): 6, Downloads (12 Months): 52, Downloads (Overall): 600, Citation Count: 5

Tracing garbage collectors traverse references from live program variables, transitively tracing out the closure live objects. Memory accesses incurred during tracing are essentially random: a given object may contain references to any other object. ...

Keywords: breadth-first, buffered prefetch, cache architecture, depth-first, garbage collection, mark-sweep, prefetch-on-grey, prefetching

Also published in:

November 2004 **SIGPLAN Notices**

Volume 39 Issue 11

December 2004 **SIGOPS Operating Systems Review**

Volume 38 Issue 5

December 2004 **SIGARCH Computer Architecture News** Volume 32 Issue 5

12 [Developing mobile 3D applications with OpenGL ES and M3G](#)

[Kari Pulli](#), [Jani Vaaraia](#), [Ville Miettinen](#), [Tomi Aarnio](#), [Mark Callow](#)

July 2005

SIGGRAPH '05: SIGGRAPH 2005 Courses

Publisher: ACM [Request Permissions](#)

Full text available: [Pdf](#) (9.22 MB)

Bibliometrics: Downloads (6 Weeks): 12, Downloads (12 Months): 153, Downloads (Overall): 1134, Citation Count: 1

13 [Adaptive, fine-grained sharing in a client-server OODBMS: a callback-based approach](#)

[Markos Zaharioudakis](#), [Michael J. Carey](#), [Michael J. Franklin](#)

December 1997

Transactions on Database Systems (TODS) , Volume 22 Issue 4

Publisher: ACM [Request Permissions](#)

Full text available: [Pdf](#) (441.80 KB)

Bibliometrics: Downloads (6 Weeks): 7, Downloads (12 Months): 30, Downloads (Overall): 533, Citation Count: 7

For reasons of simplicity and communication efficiency, a number of existing object-oriented database management systems are based on page server architectures; data pages are their minimum unit of transfer. client caching. Despite their efficiency, ...

Keywords: cache coherency, cache consistency, client-server databased, fine-grained sharing, object-oriented databases, performance analysis

14 [Out-of-core and compressed level set methods](#)

[Michael B. Nielsen](#), [Ola Nilsson](#), [Andreas Söderström](#), [Ken Museth](#)

October 2007

Transactions on Graphics (TOG) , Volume 26 Issue 4

Publisher: ACM [Request Permissions](#)


Full text available: [Pdf](#) (11.88 MB)

Bibliometrics: Downloads (6 Weeks): 11, Downloads (12 Months): 152, Downloads (Overall): 655, Citation Count

This article presents a generic framework for the representation and deformation of level set surfaces at extreme resolutions. The framework is composed ...


Keywords: Level set methods, adaptive distance fields, compression, computational fluid dynamics, deformal surfaces, geometric modeling, implicit surfaces, mesh scan conversion, morphology, out-of-core, shape, streaming

15 [A hierarchical model of data locality](#)

 [Chengliang Zhang, Chen Ding, Masanori Ogihara, Yutao Zhong, Youfeng Wu](#)

January 2006 **POPL '06:** Conference record of the 33rd ACM SIGPLAN-SIGACT symposium on Principles of programming languages

Publisher: ACM 

Full text available:  [Pdf](#) (256.26 KB)

Bibliometrics: Downloads (6 Weeks): 7, Downloads (12 Months): 53, Downloads (Overall): 534, Citation Count: 5


In POPL 2002, Petrunk and Rawitz showed a universal result---finding optimal data placement is not only NP-hard but also impossible to approximate within a constant factor if $P \neq NP$. Here we study a recently published conjecture ...

Keywords: N-body simulation, NP-complete, hierarchical data placement, program locality, reference affinity, volume distance

Also published in:



January 2006 **SIGPLAN Notices** Volume 41 Issue 1

16 [The design space of data-parallel memory systems](#)

 [Jung Ho Ahn, Matteo Erax, William J. Dally](#)

November 2006 **SC '06:** Proceedings of the 2006 ACM/IEEE conference on Supercomputing


Publisher: ACM

Full text available:  [Html](#) (2.35 KB),  [Pdf](#) (201.07 KB)

Bibliometrics: Downloads (6 Weeks): 4, Downloads (12 Months): 40, Downloads (Overall): 269, Citation Count: 8


Data-parallel memory systems must maintain a large number of outstanding memory references to fully use increasing DRAM bandwidth in the presence of rising latencies. Additionally, throughput is increasingly sensitive to the reference patterns due to ...

17 [Self-Optimizing Memory Controllers: A Reinforcement Learning Approach](#)

 [Engin Issek, Onur Mutlu, José F. Martínez, Rich Caruana](#)

June 2008 **ISCA '08:** Proceedings of the 35th Annual International Symposium on Computer Architecture

Publisher: ACM

Full text available:  [Pdf](#) (2.43 MB)

Bibliometrics: Downloads (6 Weeks): 12, Downloads (12 Months): 205, Downloads (Overall): 607, Citation Count: 15


Efficiently utilizing off-chip DRAM bandwidth is a critical issue in designing cost-effective, high-performance chip multiprocessors (CMPs). Conventional memory controllers deliver relatively low performance in part because they often employ fixed, rigid ...

Keywords: Chip Multiprocessors, Memory Systems, Memory Controller, Machine Learning, Reinforcement Learning

Also published in:

June 2008 **SIGARCH Computer Architecture News** Volume 36 Issue 3

18 [Reducing seek overhead with application-directed prefetching](#)

 [Steve VanDeBogart, Christopher Frost, Eddie Kohler](#)


June 2009 **USENIX '09:** Proceedings of the 2009 conference on USENIX Annual technical conference

Publisher: USENIX Association

Bibliometrics: Downloads (6 Weeks): n/a, Downloads (12 Months): n/a, Downloads (Overall): n/a, Citation Count: 12

An analysis of performance characteristics of modern disks finds that prefetching can improve the performance of nonsequential read access patterns by an order of magnitude or more, far more than demonstrated by prior work. Using this analysis, we design ...


19 [Automatic feedback-directed object fusing](#)

 [Christian Wimmer, Hanspeter Mössenböck](#)

September 2010

Transactions on Architecture and Code Optimization (TACO) , Volume 7 Issue 2

Publisher: ACM  [Request Permissions](#)


Full text available:  [Pdf](#) (1.44 MB)

Bibliometrics: Downloads (6 Weeks): 30, Downloads (12 Months): 39, Downloads (Overall): 39, Citation Count: 6

Object fusing is an optimization that embeds certain referenced objects into their referencing object. The order objects on the heap is changed in such a way that objects that are accessed together are placed next to each other in memory. Their offset ...


Keywords: Java, cache performance, garbage collection, just-in-time compilation, object colocation, object fusing, object inlining, optimization


20 [Hybrid and custom data structures: evolution of the data structures course](#)

 [Daniel J. Ernst, Daniel E. Stevenson, Paul J. Wagner](#)

July 2009

ITICSE '09: Proceedings of the 14th annual ACM SIGCSE conference on Innovation and technology computer science education

Publisher: ACM  [Request Permissions](#)

Full text available:  [Pdf](#) (781.32 KB)

Bibliometrics: Downloads (6 Weeks): 2, Downloads (12 Months): 95, Downloads (Overall): 138, Citation Count: 1





The topic of data structures has historically been taught with two major focuses: first, the basic definition and implementation of a small set of basic data structures (e.g. list, stack, queue, tree, graph), and second, the usage of these basic data ...

Keywords: data structures

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